

Docket: UDC-20201 CON

IN THE CLAIMS:

1. (Withdrawn) An organic optoelectronic device structure comprising:

a first barrier region comprising a substrate layer and a plurality of cooperative barrier layers disposed on said substrate layer, said plurality of cooperative barrier layers further comprising a planarizing layer and a high-density layer, wherein said high-density layer is disposed over said planarizing layer in a manner such that said high-density layer extends to said substrate layer and, in conjunction with said substrate layer completely surrounds said planarizing layer;

an organic optoelectronic device disposed over said first barrier region, said organic optoelectronic device selected from an organic light emitting diode, an organic electrochromic display, an organic photovoltaic device and an organic thin film transistor; and

a second barrier region disposed over said organic optoelectronic device.

2. (Withdrawn) The organic optoelectronic device structure of claim 1, wherein said plurality of cooperative barrier layers comprises two or more planarizing layers and two or more high-density layers, and wherein each overlying cooperative barrier layer that is disposed over one or more underlying cooperative barrier layers extends to the substrate layer in a manner such that said one or more underlying cooperative barrier layers are surrounded by said substrate and said each overlying cooperative barrier layer.

3. (Withdrawn) The organic optoelectronic device structure of claim 1, wherein said cooperative barrier layers comprise an alternating series of two or more planarizing layers and two or more high-density layers.

4. (Withdrawn) The organic optoelectronic device structure of claim 1, wherein said second barrier region comprises a metal layer.

5. (Withdrawn) The organic optoelectronic device structure of claim 1, wherein said substrate layer is a polymer substrate layer.

Docket: UDC-20201 CON

6. (Withdrawn) The organic optoelectronic device structure of claim 5, wherein said polymer substrate layer comprises one or more polymers selected from a polyester, a polyolefin, a polycarbonate, a polyether, a polyimide and a polyfluorocarbon.
7. (Withdrawn) The organic optoelectronic device structure of claim 1, wherein said planarizing layer comprises a material selected from fluorinated polymers, parylenes, cyclotenes and polyacrylates.
8. (Withdrawn) The organic optoelectronic device structure of claim 1, wherein said high-density layer comprises a material selected from metal oxides, metal nitrides, metal carbides, metals and metal oxynitrides.
9. (Withdrawn) An OLED structure comprising:
- a first barrier region comprising a substrate layer and a plurality of first cooperative barrier layers disposed on said substrate layer, said plurality of first cooperative barrier layers further comprising a first planarizing layer and a first high-density layer, wherein said first high-density layer is disposed over said first planarizing layer in a manner such that said first high-density layer extends to said substrate layer and, in conjunction with said substrate layer, completely surrounds said first planarizing layer;
 - an OLED disposed over said first barrier region, said OLED comprising an anode, a cathode and an organic emissive layer; and
 - a second barrier region disposed over said OLED.
10. (Withdrawn) The OLED structure of claim 9, wherein said plurality of first cooperative barrier layers comprises two or more first planarizing layers and two or more first high-density layers, and wherein each overlying first cooperative barrier layer that is disposed over one or more underlying first cooperative barrier layers extends to the substrate layer in a manner such that said one or more underlying first cooperative barrier layers are surrounded by said substrate layer and said each overlying first cooperative barrier layer.

Docket: UDC-20201 CON

11. (Withdrawn) The OLED structure of claim 9, wherein said first cooperative barrier layers comprise an alternating series of two or more first planarizing layers and two or more first high-density layers.
12. (Withdrawn) The OLED structure of claim 11, wherein said alternating series comprises 3 to 7 first planarizing layers and 3 to 7 first high-density layers.
13. (Withdrawn) The OLED structure of claim 9, wherein said first planarizing layer comprises a material selected from fluorinated polymers, parylenes, cyclotenes and polyacrylates.
14. (Withdrawn) The OLED structure of claim 9, wherein said first high-density layer comprises a material selected from metal oxides, metal nitrides, metal carbides, metals and metal oxynitrides.
15. (Withdrawn) The OLED structure of claim 9, wherein said first high-density layer comprises a material selected from silicon oxide, silicon nitride, aluminum oxide, indium tin oxide and zinc indium tin oxide.
16. (Withdrawn) The OLED structure of claim 9, wherein said substrate layer is a polymer substrate layer.
17. (Withdrawn) The OLED structure of claim 17, wherein said polymer substrate layer comprises one or more polymers selected from a polyester, a polyolefin, a polycarbonate, a polyether, a polyimide and a polyfluorocarbon.
18. (Withdrawn) The OLED structure of claim 17, wherein said polymer substrate layer comprises one or more polymers selected from a polyethersulphone, a polyarylate, a polyestercarbonate, a polyethylenenaphthalate, a polyethyleneterephthalate, a polyetherimide, a polyacrylate, and a polynorbornene.

Docket: UDC-20201 CON

19. (Withdrawn) The OLED structure of claim 18, wherein said polymer substrate layer is a polyethyleneterephthalate layer.
20. (Withdrawn) The OLED structure of claim 17, wherein said polymer substrate layer ranges from 75 to 625 microns in thickness.
21. (Withdrawn) The OLED structure of claim 9, wherein said second barrier region comprises a metal layer.
22. (Withdrawn) The OLED structure of claim 9, wherein said first barrier region is bonded to said second barrier region by an adhesive region.
23. (Withdrawn) The OLED structure of claim 22, wherein said adhesive region comprises an epoxy material.
24. (Withdrawn) The OLED structure of claim 9, wherein said second barrier region comprises a plurality of second cooperative barrier layers, said plurality of second cooperative barrier layers further comprising a second planarizing layer and a second high-density layer, and wherein said second high-density layer is disposed over said second planarizing layer in a manner such that said second high-density layer extends to said first barrier region and, in conjunction with said first barrier region, completely surrounds said second planarizing layer.
25. (Withdrawn) The OLED structure of claim 24, wherein said plurality of second cooperative barrier layers comprises two or more second planarizing layers and two or more second high-density layers, and wherein each overlying second cooperative barrier layer that is disposed over one or more underlying second cooperative barrier layers extends to the first barrier region in a manner such that said one or more underlying second cooperative barrier layers are surrounded by said first barrier region and said each overlying second cooperative barrier layer.

Docket: UDC-20201 CON

26. (Withdrawn) The OLED structure of claim 24, wherein said second cooperative barrier layers comprise an alternating series of two or more second planarizing layers and two or more second high-density layers.
27. (Withdrawn) The OLED structure of claim 26, wherein said alternating series comprises 3 to 7 second planarizing layers and 3 to 7 second high-density layers.
28. (Withdrawn) The OLED structure of claim 24, wherein said second planarizing layer comprises a material selected from fluorinated polymers, parylenes, cyclotenes and polyacrylates.
29. (Withdrawn) The OLED structure of claim 24, wherein said second high-density layer comprises a material selected from metal oxides, metal nitrides, metal carbides, metals and metal oxynitrides.
30. (Withdrawn) The OLED structure of claim 24, wherein said second high-density layer comprises a material selected from silicon oxide, silicon nitride, aluminum oxide, indium tin oxide and zinc indium tin oxide.
31. (Withdrawn) The OLED structure of claim 9, further comprising a gettering material disposed between said first and second barrier regions.
32. (Withdrawn) The OLED structure of claim 9, further comprising a third barrier region disposed between said first barrier region and said OLED, said third barrier region comprising a plurality of third cooperative barrier layers, said plurality of third cooperative barrier layers further comprising a third planarizing layer and a third high-density layer, wherein said third high-density layer is disposed over said third planarizing layer in a manner such that said third high-density layer extends to said first barrier region and, in conjunction with said first barrier region, completely surrounds said at least one third planarizing layer.
- 33-43. (Cancelled)

Docket: UDC-20201 CON

44. (Previously presented) An organic optoelectronic device structure comprising:

a substrate;

an organic optoelectronic device disposed over said substrate, said organic optoelectronic device selected from an organic light emitting diode, an organic electrochromic display, an organic photovoltaic device and an organic thin film transistor; and

a barrier region disposed over said organic optoelectronic device, said barrier region comprising a plurality of cooperative barrier layers, said plurality of cooperative barrier layers further comprising a planarizing layer and a high-density layer, wherein said high-density layer is disposed over said planarizing layer in a manner such that said high-density layer extends to said substrate layer and, in conjunction with said substrate layer, completely surrounds said planarizing layer.

45. (Previously presented) The OLED structure of claim 44, wherein said plurality of cooperative barrier layers comprises two or more planarizing layers and two or more high-density layers, and wherein each overlying cooperative barrier layer that is disposed over one or more underlying cooperative barrier layers extends to the substrate in a manner such that said one or more underlying cooperative barrier layers are surrounded by said substrate and said each overlying cooperative barrier layer.

46. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said cooperative barrier layers comprise an alternating series of two or more planarizing layers and two or more high-density layers.

47. (Previously presented) The organic optoelectronic device structure of claim 46, wherein said alternating series comprises 3 to 7 planarizing layers and 3 to 7 high-density layers.

48. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said planarizing layer comprises a material selected from fluorinated polymers, parylenes, cyclotenes and polyacrylates.

Docket: UDC-20201 CON

49. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said high-density layer comprises a material selected from metal oxides, metal nitrides, metal carbides, metals and metal oxynitrides.

50. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said high-density layer comprises a material selected from silicon oxide, silicon nitride, aluminum oxide, indium tin oxide and zinc indium tin oxide.

51. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said organic optoelectronic device is an OLED device.

52. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said substrate is a rigid substrate.

53. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said substrate is a flexible substrate.

54. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said substrate comprises a metal foil.

55. (Previously presented) The organic optoelectronic device structure of claim 44, wherein said substrate comprises a rigid glass layer.

56. (New) The organic optoelectronic device structure of claim 44, wherein said organic optoelectronic device is an organic electrochromic display.

57. (New) The organic optoelectronic device structure of claim 44, wherein said organic optoelectronic device is an organic photovoltaic device.

Docket: UDC-20201 CON

58. (New) The organic optoelectronic device structure of claim 44, wherein said organic optoelectronic device is an organic thin film transistor